



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,515	10/26/2005	Ian E Kibblewhite	LOAD2 US	4336
7590 06/09/2010				
Gary M Cohen Strafford Building Number Three 125 Strafford Avenue Suite 300 Wayne, PA 19087-3318			EXAMINER DUNLAP, JONATHAN M	
			ART UNIT 2855	PAPER NUMBER
			MAIL DATE 06/09/2010	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/528,515

**Applicant(s)**

KIBBLEWHITE ET AL.

**Examiner**

Jonathan Dunlap

**Art Unit**

2855

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

1. A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 May 2010.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-45 is/are pending in the application.  
4a) Of the above claim(s) 19-45 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-18 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO/SB/22)  
Paper No(s)/Mail Date 5/25/2010  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 25, 2010, has been entered.
2. All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued examination and the submission under 37 CFR 1.114. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

***Information Disclosure Statement***

3. The information disclosure statement (IDS) submitted on May 25, 2010 was filed after the mailing date of the Final Office Action on December 28, 2009. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

***Election/Restrictions***

4. Claims 39-45, as previously submitted on November 20, 2008, are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Claims 39-45 incorporate the subject matter of claims 19-28, which was previously restricted. The subject matter of the claims, although stated as an apparatus, features method steps, and as such, are essentially the subject matter of the previously restricted claims.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 39-45 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

5. This application contains claims 19-38 drawn to an invention nonelected with traverse in the reply filed on April 9, 2007. A complete reply to the final rejection must include cancellation of all nonelected claims, 19-45 or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 1-18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 1 is rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. Page 6 of the specification requires that heat/temperature compensation be imparted to the combination of the ultrasonic transducer and the fastener in order to create accurate, precise and reliable critical joints, this structure or step is deemed critical or essential to the practice of the invention, but not included in the claim(s), and as such, the scope of the claim is not enabled by the disclosure. "A claim which omits matter disclosed to be essential to the invention as described in the specification or in other statements of record may also be

subject to rejection under 35 U.S.C. 112, 1<sup>st</sup>, as not enabling, or under 35 U.S.C. 112, 2<sup>nd</sup>. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976); *In re Venezia*, 530 F.2d 956, 189 USPQ 149 (CCPA 1976); and *In re Collier*, 397 F.2d 1003, 158 USPQ 266 (CCPA 1968). See also MPEP § 2172.01.

The claim is directed towards an apparatus for precisely and reliably assembling a critical joint, comprising: a thread-forming fastener including a head for engagement by a tool for applying a torque to the fastener, and a body portion extending from the head and including thread-forming portions; and an ultrasonic transducer coupled with the fastener, for making precise and reliable ultrasonic load measurements in the fastener.

Upon review of the specification filed on March 18, 2005, the Examiner takes notice that on page 6, lines 14-22, Applicant has specifically stated that "[w]ithout compensation, this thermal effect can result in inaccuracies of load measurement on the order of 5% to 20%, depending on the bolt, the joint and the assembly process being used." It is therefore the opinion of the Examiner, since no other structural elements have been claimed, that the uncompensated apparatus as presently claimed contains subject matter which is not enabled by the description, and therefore, the Examiner must rely on the 5% to 20% error benchmark for the assertion of precise and reliable load measurements.

Claim 10 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not

described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 10 is rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. Page 6 of the specification requires that heat/temperature compensation be imparted to the combination of the ultrasonic transducer and the fastener in order to create accurate, precise and reliable critical joints, this structure or step is deemed critical or essential to the practice of the invention, but not included in the claim(s), and as such, the scope of the claim is not enabled by the disclosure. "A claim which omits matter disclosed to be essential to the invention as described in the specification or in other statements of record may also be subject to rejection under 35 U.S.C. 112, 1<sup>st</sup>, as not enabling, or under 35 U.S.C. 112, 2<sup>nd</sup>. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976); *In re Venezia*, 530 F.2d 956, 189 USPQ 149 (CCPA 1976); and *In re Collier*, 397 F.2d 1003, 158 USPQ 266 (CCPA 1968). See also MPEP § 2172.01.

The claim is directed towards a method of making a load indicating, thread-forming fastener for precisely and reliably assembling a critical joint, comprising the steps of: providing a fastener having a first end including a surface for receiving an ultrasonic transducer, for making ultrasonic load measurements in the fastener, a shank extending from the first end and including thread-forming portions for tapping a hole, and a second end, opposite the first end and including a surface for reflecting an ultrasonic wave back to the first end; and attaching an ultrasonic transducer for making

precise and reliable ultrasonic load measurements in the fastener to the first end of the fastener.

Upon review of the specification filed on March 18, 2005, the Examiner takes notice that on page 6, lines 14-22, Applicant has specifically stated that "[w]ithout compensation, this thermal effect can result in inaccuracies of load measurement on the order of 5% to 20%, depending on the bolt, the joint and the assembly process being used." It is therefore the opinion of the Examiner, since no other method steps have been claimed, that the uncompensated method as presently claimed contains subject matter which is not enabled by the description, and therefore, the Examiner must rely on the 5% to 20% error benchmark for the assertion of precise and reliable load measurements.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. **Claims 1-5 and 7** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Fulmer (U.S. Patent 5,242,253)** in view of **Kibblewhite (U.S. Patent 5,131,276)**.

Considering **claim 1**, Fulmer discloses an apparatus comprising a thread-forming fastener including:



- A head **12** for engagement by a tool for applying a torque to the fastener **10** (**Figure 1; Column 2, line 67**); and
- A body portion **14** extending from the head **12** and including thread-forming portions **18** (**Figures 1-2; Column 2, line 68; Column 3, lines 7-9, lines 50-68; Column 4, lines 1-14**).

The invention by Fulmer fails to disclose an ultrasonic transducer coupled with the fastener, for making ultrasonic load measurements in the fastener.

However, Kibblewhite teaches an ultrasonic transducer **19** coupled with the fastener **10**, for making ultrasonic load measurements in the fastener **10** (**Figure 1; Column 7, lines 16-26; Column 8, lines 31-40**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to couple an ultrasonic transducer for load measurements to a fastener as taught by Kibblewhite in the invention by Fulmer. The motivation for doing so is found in the teachings of Kibblewhite, "the load indicating member can be formed from a bolt, rod, rivet, stud or other suitable structural element" (**Column 6, lines 15-16**).

The combination of the prior art references teaches an ultrasonic transducer applied to a thread-forming fastener which has a head and a body portion. One of ordinary skill in the art at the time the invention was made would have recognized that a thread-forming fastener and a bolt, rod, rivet or stud are known equivalents for providing a secure connection between structural elements within the fastener art. It would have been obvious to one of ordinary skill in the art at the time the invention was made to

substitute one known element (thread-forming fastener) for another known equivalent (bolt, rod, rivet, stud) resulting in the predictable result of forming a secure connection between structural elements.

Considering **claim 2**, Fulmer fails to disclose that the ultrasonic transducer is coupled with the head of the fastener.

However, Kibblewhite teaches that the ultrasonic transducer **19** is coupled with the head **13** of the fastener **10** (**Figures 1-7; Column 7, lines 18-32; Column 8, lines 31-2, lines 38-40; Column 11, lines 45-48**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to couple an ultrasonic transducer for load measurements to the head of a fastener as taught by Kibblewhite in the invention by Fulmer. The motivation for doing so is to provide a location which both electrically and mechanically connects the fastener to a tightening tool for displaying load measurements as found in the teachings of Kibblewhite, "the tightening tool may be provided with a display device fore displaying ultrasonic measurement of the tensile load, stress, elongation or member identification obtained during operation" and "the head is also provided with a wrenching or tool engagement surface, such as a hexagonal wrenching surface" (**Column 6, lines 24-50; Column 7, lines 29-31**).

Considering **claim 3**, Fulmer fails to disclose that the ultrasonic transducer is permanently attached to the fastener.

However, Kibblewhite teaches that the ultrasonic transducer **19** is permanently attached to the fastener **10** (**Column 3, lines 5-9**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to permanently couple an ultrasonic transducer to a fastener as taught by Kibblewhite in the invention by Fulmer. The motivation for doing so is found in the teachings of Kibblewhite, "to provide accurate tightening information during assembly, which can not come loose and cause an obstruction in or damage to a critical assembly" (**Column 3, lines 5-9**).

Considering **claim 4**, Fulmer fails to disclose that the ultrasonic transducer is comprised of a piezoelectric polymer film permanently attached to the head of the fastener.

However, Kibblewhite teaches that the ultrasonic transducer **19** is comprised of a piezoelectric polymer film permanently attached to the head **13** of the fastener **10** (**Figure 2; Column 7, lines 42-48; Column 9, lines 58-61**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a piezoelectric polymer within an ultrasonic transducer as taught by Kibblewhite in the invention by Fulmer. The motivation for doing so is found in the teachings of Kibblewhite, "piezoelectric polymer materials...are, in theory, slightly more efficient than the materials of the present invention when used in ultrasonic pulse-echo applications" (**Column 10, lines 25-28**).

Considering **claim 5**, Fulmer fails to disclose that the ultrasonic transducer is comprised of an oriented piezoelectric thin film, vapor deposited directly on the head of the fastener.

However, Kibblewhite teaches that the ultrasonic transducer **19** is comprised of an oriented piezoelectric thin film, vapor deposited directly on the head **13** of the fastener **10** (**Column 4, lines 10-16**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize an oriented piezoelectric thin film, vapor deposited directly on the head of a fastener as taught by Kibblewhite in the invention by Fulmer. The motivation for doing so is found in the teachings of Kibblewhite, "the crystal inclination angle of piezoelectric oriented films can be controlled...through the control of inclination angle, the control of the fractional components of longitudinal and transverse ultrasonic waves," is feasible and through "the use of both longitudinal and transverse waves...the measurement of stress in a member without taking a zero load measurement," is permitted (**Column 9, lines 9-24**).

Considering **claim 7**, Fulmer fails to disclose that the ultrasonic transducer is temporarily attached to the fastener.

However, Kibblewhite teaches that the ultrasonic transducer is temporarily attached to the fastener (**Column 1, lines 36-45**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a temporarily attached ultrasonic transducer with a fastener as taught by Kibblewhite in the invention by Fulmer. The motivation for doing so is found in the teachings of Kibblewhite, "the prior art teachings include the notion of combining the measuring device with a tightening tool so that the information

gained from measuring the elongation of the bolt can be used for determining when to shut off the tool" (**Column 1, lines 46-52**).

10. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Fulmer (U.S. Patent 5,242,253)** in view of **Kibblewhite (U.S. Patent 5,131,276)** and further in view of **Sanduja et al. (U.S. Patent 6,726,960)**.

The invention by Fulmer, as modified by Kibblewhite, fails to disclose that the ultrasonic transducer is chemically grafted on the head of the fastener.

However, Sanduja et al. teaches that ultrasonic transducer is chemically grafted on the head of the fastener (**Column 1, lines 9-15; Column 2, lines 45-56**).

Therefore, it would have been obvious to one skilled in the art of bonding at the time the invention was made to chemically graft an ultrasonic transducer on the head of a fastener as taught by Sanduja in the invention by Fulmer, as modified by Kibblewhite. The motivation for doing so is found in both the teachings of Kibblewhite and Sanduja. According to Kibblewhite, "what is secondly desired is such ultrasonic transducer permanently attached to a fastener which can withstand the operating environment" (**Column 3, lines 10-12**). According to Sanduja, "grafting a protective coating onto metallic parts...not only protects the part from corrosion and other adverse effects of the environmental conditions of temperature...but also imparts an excellent degree of abrasion resistance." (**Column 1, lines 8-15**). Still further, according to Sanduja, "this process, using the composition specified, will have general utility in a number of

applications...the superior bonding achieved will confer improved corrosion" (**Column 2, lines 52-55**).

11. **Claims 8-9** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Fulmer (U.S. Patent 5,242,253)** in view of **Kibblewhite (U.S. Patent 5,131,276)** and further in view of **Hoffmeister et al. (WO 00/63565)**.

The invention by Fulmer, as modified by Kibblewhite, fails to teach that the ultrasonic transducer further includes an information storage medium applied to the ultrasonic transducer and that the information storage medium is a bar code.

However, Hoffmeister teaches that the ultrasonic transducer further includes an information storage medium **4** applied to the ultrasonic transducer and that the information storage medium is a bar code (**Figure 1; Page 2, lines 24-36; Page 3, lines 1-35; Page 4, lines 1-14**).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to use a bar code as an information storage medium, applied to a ultrasonic transducer as taught by Hoffmeister in the invention by Fulmer, as modified by Kibblewhite. The motivation for doing so is to prevent the use of low-quality counterfeit fasteners, as taught by Hoffmeister (**Page 4, lines 16-28**).

12. **Claims 10-14 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Fulmer (U.S. Patent 5,242,253)** in view of **Kibblewhite (U.S. Patent 5,131,276)**.

Considering **claim 10**, Fulmer discloses a method of making a load indicating, thread-forming fastener, comprising the steps of:

- Providing a fastener having:
  - A first end **12** including a surface for receiving an ultrasonic transducer, for making ultrasonic load measurements in the fastener **10**;
  - A shank **14** extending from the first end **12** and including thread-forming portions **18** for tapping a hole, and
  - A second end, opposite the first end and including a surface for reflecting an ultrasonic wave back to the first end **12** (**Figures 1-2; Column 2, lines 67-68; Column 3, lines 7-9, lines 50-68; Column 4, lines 1-14**).

The invention by Fulmer fails to disclose attaching an ultrasonic transducer to the first end of the fastener.

However, Kibblewhite teaches attaching an ultrasonic transducer **19** to the first end **13** of the fastener **10** (**Figure 1; Column 7, lines 16-26; Column 8, lines 31-40**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to couple an ultrasonic transducer to a first end of a fastener as taught by Kibblewhite in the invention by Fulmer. The motivation for doing so is found in the teachings of Kibblewhite, "the load indicating member can be formed from a bolt, rod, rivet, stud or other suitable structural element" (**Column 6, lines 15-16**).

The combination of the prior art references teaches an ultrasonic transducer applied to a thread-forming fastener which has a head and a body portion. One of ordinary skill in the art at the time the invention was made would have recognized that a thread-forming fastener and a bolt, rod, rivet or stud are known equivalents for providing a secure connection between structural elements within the fastener art. It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute one known element (thread-forming fastener) for another known equivalent (bolt, rod, rivet, stud) resulting in the predictable result of forming a secure connection between structural elements.

Considering **claim 11**, Fulmer fails to disclose attaching the ultrasonic transducer to a head associated with the first end of the thread forming fastener, for engagement by a tool for applying a torque to the fastener.

However, Kibblewhite teaches attaching the ultrasonic transducer to a head **13** associated with the first end of the thread forming fastener, for engagement by a tool for applying a torque to the fastener (**Figures 1-7; Column 7, lines 18-32; Column 8, lines 31-2, lines 38-40; Column 11, lines 45-48**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to couple an ultrasonic transducer for load measurements to the head of a fastener as taught by Kibblewhite in the invention by Fulmer. The motivation for doing so is to provide a location which both electrically and mechanically connects the fastener to a tightening tool for displaying load measurements as found in the teachings of Kibblewhite, "the tightening tool may be provided with a display device



fore displaying ultrasonic measurement of the tensile load, stress, elongation or member identification obtained during operation” and “the head is also provided with a wrenching or tool engagement surface, such as a hexagonal wrenching surface” (**Column 6, lines 24-50; Column 7, lines 29-31**).

Considering **claim 12**, Fulmer fails to disclose permanently attaching the ultrasonic transducer to the fastener.

However, Kibblewhite teaches that the ultrasonic transducer **19** is permanently attached to the fastener **10** (**Column 3, lines 5-9**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to permanently couple an ultrasonic transducer to a fastener as taught by Kibblewhite in the invention by Fulmer. The motivation for doing so is found in the teachings of Kibblewhite, “to provide accurate tightening information during assembly, which can not come loose and cause an obstruction in or damage to a critical assembly” (**Column 3, lines 5-9**).

Considering **claim 13**, Fulmer fails to disclose permanently attaching an ultrasonic transducer comprised of a piezoelectric polymer film to the first end of the fastener.

However, Kibblewhite teaches permanently attaching an ultrasonic transducer **19** comprised of a piezoelectric polymer film to the first end **13** of the fastener **10** (**Figure 2; Column 7, lines 42-48; Column 9, lines 58-61**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a piezoelectric polymer within an ultrasonic

transducer as taught by Kibblewhite in the invention by Fulmer. The motivation for doing so is found in the teachings of Kibblewhite, "piezoelectric polymer materials...are, in theory, slightly more efficient than the materials of the present invention when used in ultrasonic pulse-echo applications" (**Column 10, lines 25-28**).

Considering **claim 14**, Fulmer fails to disclose vapor depositing an ultrasonic transducer comprised of an oriented piezoelectric thin film directly onto the first end of the fastener.

However, Kibblewhite teaches that the ultrasonic transducer **19** is comprised of an oriented piezoelectric thin film, vapor deposited directly on the head **13** of the fastener **10** (**Column 4, lines 10-16**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize an oriented piezoelectric thin film, vapor deposited directly on the head of a fastener as taught by Kibblewhite in the invention by Fulmer. The motivation for doing so is found in the teachings of Kibblewhite, "the crystal inclination angle of piezoelectric oriented films can be controlled...through the control of inclination angle, the control of the fractional components of longitudinal and transverse ultrasonic waves," is feasible and through "the use of both longitudinal and transverse waves...the measurement of stress in a member without taking a zero load measurement," is permitted (**Column 9, lines 9-24**).

Considering **claim 16**, Fulmer fails to disclose temporarily attaching the ultrasonic transducer to the fastener.

However, Kibblewhite teaches that the ultrasonic transducer is temporarily attached to the fastener (**Column 1, lines 36-45**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a temporarily attached ultrasonic transducer with a fastener as taught by Kibblewhite in the invention by Fulmer. The motivation for doing so is found in the teachings of Kibblewhite, "the prior art teachings include the notion of combining the measuring device with a tightening tool so that the information gained from measuring the elongation of the bolt can be used for determining when to shut off the tool" (**Column 1, lines 46-52**).

13. **Claim 15** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Fulmer (U.S. Patent 5,242,253)** in view of **Kibblewhite (U.S. Patent 5,131,276)** and further in view of **Sanduja et al. (U.S. Patent 6,726,960)**.

The invention by Fulmer, as modified by Kibblewhite, fails to disclose chemically grafting an ultrasonic transducer onto the first end of the fastener

However, Sanduja et al. teaches chemically grafting an ultrasonic transducer onto the first end of the fastener (**Column 1, lines 9-15; Column 2, lines 45-56**).

Therefore, it would have been obvious to one skilled in the art of bonding at the time the invention was made to chemically graft an ultrasonic transducer on the head of a fastener as taught by Sanduja in the invention by Fulmer, as modified by Kibblewhite. The motivation for doing so is found in both the teachings of Kibblewhite and Sanduja. According to Kibblewhite, "what is secondly desired is such ultrasonic transducer

permanently attached to a fastener which can withstand the operating environment" (**Column 3, lines 10-12**). According to Sanduja, "grafting a protective coating onto metallic parts...not only protects the part from corrosion and other adverse effects of the environmental conditions of temperature...but also imparts an excellent degree of abrasion resistance." (**Column 1, lines 8-15**). Still further, according to Sanduja, "this process, using the composition specified, will have general utility in a number of applications...the superior bonding achieved will confer improved corrosion" (**Column 2, lines 52-55**).

14. **Claims 17-18** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Fulmer (U.S. Patent 5,242,253)** in view of **Kibblewhite (U.S. Patent 5,131,276)** and further in view of **Hoffmeister et al. (WO 00/63565)**.

The invention by Fulmer, as modified by Kibblewhite, fails to teach applying an information storage medium to the ultrasonic transducer, wherein the information storage medium includes markings corresponding to data associated with the fastener and applying a bar code to the ultrasonic transducer.

However, Hoffmeister teaches that the ultrasonic transducer further includes an information storage medium **4** applied to the ultrasonic transducer and that the information storage medium is a bar code (**Figure 1; Page 2, lines 24-36; Page 3, lines 1-35; Page 4, lines 1-14**).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to use a bar code as an information storage medium, applied to a

ultrasonic transducer as taught by Hoffmeister in the invention by Fulmer, as modified by Kibblewhite. The motivation for doing so is to prevent the use of low-quality counterfeit fasteners, as taught by Hoffmeister (**Page 4, lines 16-28**).

### ***Response to Arguments***

Applicant has not submitted any new arguments and as such, the Examiner will merely reiterate the position maintained in the Office Action of December 28, 2009.

Applicant's arguments filed November 20, 2008 have been fully considered but they are not persuasive.

Applicant argues that the specification is enabling for an "apparatus for precisely and reliably assembling a critical joint" and for a "method of making a load indicating, thread-forming fastener for precisely and reliably assembling a critical joint". However, the claims do not incorporate the essential subject matter which enables claims. Since the details of the specification can not be brought into the claimed limitations, the essential subject matter which enables the claim must be presented therein. See explanation under 35 U.S.C. 112 1<sup>st</sup>. A thread-forming fastener and an ultrasonic transducer, without modification/compensation, is not disclosed as being capable of approaching errors outside the range of 5%-20%.

Furthermore, a precise and reliable load measurement does not mean accurate and reliable. Applicant has argued that "accuracies of up to 3% would be considered appropriate for critical applications" (Page 18, lines 11-12 of response as filed on November 20, 2008). Applicant has not claimed accurate results with an error of less

than 1-5%. Therefore, inaccurate results would not teach away from a combination of a thread forming fastener and an ultrasonic transducer to create a precise, although inaccurate, load measurement device.

The Examiner maintains that a thread-forming fastener is an equivalent structure to that of a bolt, rivet, rod or stud.

The Examiner did not rely on improper hindsight to formulate that the use of ultrasonic transducers to measure loads with precision would have been obvious, (See Kibblewhite, 5,131,276, Column 10, lines 46-53).

### ***Conclusion***

This is a continuation of applicant's earlier Application No. 10/528,515. All claims are drawn to the same invention claimed in the earlier application and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the earlier application. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action in this case. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no, however, event will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Dunlap whose telephone number is (571)270-1335. The examiner can normally be reached on M-F 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lisa Caputo can be reached on (571) 272-2388. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. D./  
Examiner, Art Unit 2855  
June 5, 2010

/Lisa M. Caputo/  
Supervisory Patent Examiner, Art Unit 2855